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Patient Capital and Corporate Human Capital Upgrading: Evidence from Chinese Listed Firms

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Abstract. As economies transition from demographic dividends to human capital-driven growth, patient capital—investment allocations focused on long-term value creation—emerges as a critical driver of corporate competitiveness. Using a panel dataset of Chinese A-share listed firms from 2007 to 2023, this paper investigates the impact of patient capital on firm-level human capital and explores its underlying mechanisms. We find a robust positive effect of patient capital on corporate human capital upgrading. Mechanism analyses reveal that this effect operates through three channels: capital deepening, the expansion of research and development (R&D) investments, and strengthened internal and external monitoring. Furthermore, this positive effect is more pronounced among state-owned enterprises (SOEs), firms located in economically developed eastern regions, and those without CEO duality. Our findings provide micro-level evidence that patient capital can facilitate the transition from demographic to human capital-driven growth, informing policies aimed at optimizing long-term investments and talent structures.

Keywords: Patient Capital; Corporate Human Capital; R&D Expansion; Corporate Monitoring.

1. Introduction

As China transitions from a phase of high-speed growth to high-quality development amid global supply chain restructuring, the allocation and operational models of capital play a pivotal role in sustaining its long-term economic competitiveness. Patient capital—defined as investments prioritizing long-term value creation over short-term returns—has emerged as a crucial catalyst for fostering productivity and high-quality economic growth [1]. Recent macroeconomic policies in China have elevated the expansion of patient capital to a strategic priority. Successive directives from top policy-making bodies in 2024 and 2025 have explicitly emphasized the need to regulate and expand venture capital, private equity, and government-guided funds to cultivate patient capital. Cultivating patient capital has thus become an institutional consensus aimed at building the nation's long-term competitive advantages and consolidating the foundation for modernization.

Patient capital is characterized by its strategic orientation, stability, risk tolerance, and accountability [2]. At the macro level, existing literature widely recognizes it as a cornerstone of technological innovation and industrial upgrading, providing the financial resilience necessary to enhance international competitiveness [3-4]. At the micro level, the infusion of patient capital has been shown to alleviate financing constraints, strengthen corporate governance, and spur firm-level innovation [5].

As the economy pivots from demographic dividends to human capital-driven growth, patient capital, with its unique long-term horizon and risk tolerance, is well-positioned to drive the structural upgrading of corporate human capital. Theoretically, this occurs through several channels. First, consistent with the capital-skill complementarity hypothesis, long-term physical capital investments backed by patient capital increase the demand for highly skilled labor [6]. Second, the expansion of R&D investments driven by patient capital simultaneously raises the demand for skilled talent while accelerating the displacement of low-skilled positions [7]. Finally, acting as engaged blockholders, patient capital investors can improve corporate governance and curb managerial myopia, thereby realigning corporate strategies toward cultivating long-term core competencies, including human capital [8]. This raises a crucial empirical question: Does patient capital facilitate the upgrading of

corporate human capital? If so, does it operate primarily through capital deepening, R&D expansion, or enhanced corporate monitoring?

To answer these questions, we exploit a panel dataset of Chinese A-share listed firms from 2007 to 2023. We document a robust positive effect of patient capital on corporate human capital levels, a finding that holds after rigorously addressing potential endogeneity concerns. Heterogeneity analyses reveal that this effect is more pronounced among firms located in the developed eastern regions, state-owned enterprises (SOEs), and firms without CEO duality. Mechanism tests suggest that patient capital promotes human capital upgrading through three channels: capital deepening, R&D-induced skill-biased creative destruction, and strengthened corporate monitoring.

This paper contributes to the literature in three main ways. First, we broaden the perspective on the real effects of patient capital. While previous studies have primarily linked patient capital to firm innovation, performance, TFP, and resilience [7], we focus on its consequences for corporate human capital composition. This provides a novel addition to both the patient capital literature and the framework determining firm-level human capital. Second, we unpack the multidimensional transmission mechanisms from the perspectives of capital, technology, and corporate governance. Distinct from existing research, we clarify how patient capital drives labor upgrading through capital deepening, skill-biased creative destruction via R&D, and corporate monitoring. Third, by systematically examining the heterogeneous effects across geographic locations, ownership structures, and management models, we offer empirical foundations for policymakers and market participants seeking to optimize long-term investment strategies.

The remainder of the paper proceeds as follows: Section II reviews the literature and develops the hypotheses. Section III outlines the empirical design. Section IV presents the main results. Section V conducts further analyses, and Section VI concludes.

2. Literature Review and Hypothesis Development

Literature Review. (1) Patient Capital. Patient capital refers to investments that prioritize long-term value creation, tolerate short-term volatility, and support the sustainable growth of investees [2]. The literature largely defines patient capital from two perspectives. In comparative political economy, it is characterized as equity or debt that withstands short-term fluctuations to pursue long-term value [9]. Such patient capital demonstrates unique advantages in generating excess returns and mitigating systemic risks [10]. From the perspective of New Structural Economics, it is viewed as an ultra-long-term, relationship-based investment aimed at mutual benefit [11]. Despite these differing lenses, both highlight a long-termist core dedicated to value creation beyond traditional financial instruments.

At the macro level, studies suggest that patient capital drives industrial upgrading [12], economic growth, and the development of new quality productive forces[12]. Furthermore, it facilitates the realization of multiple policy goals, serving as a strategic tool for high-quality development[13]. At the micro level, patient capital plays a crucial role in alleviating information asymmetry. Acting as an active external monitor, it improves corporate governance by optimizing executive compensation, enhancing investment efficiency [5], and selecting high-caliber managers. Furthermore, by providing stable financial backing and increasing tolerance for innovation failure [7], patient capital directly empowers firms to undertake long-term strategic initiatives and technological upgrading.

(2) Human Capital. The concept of human capital, systematically conceptualized by Schultz (1960)[14] and further developed by Becker [15], posits that investments in education and training accumulate as a stock of knowledge and skills embodied in workers, ultimately enhancing productivity and yielding future returns. The determinants of corporate human capital upgrading have been explored from both macro-policy and micro-firm perspectives. Macroeconomically, scholars have documented the effects of trade liberalization, financial frictions, tax incentives [16], and banking deregulation. For instance, stricter social security tax enforcement compels firms to adjust their labor structures and increase capital investments, thereby upgrading human capital while

reducing total labor costs [17]. Microeconomically, corporate governance and operational shifts—such as technological progress, digital transformation [18], mergers and acquisitions, and non-state shareholder participation [19], and internal wage gaps [20]—have been identified as key drivers of human capital optimization.

(3) Literature Gap. Despite extensive research on patient and human capital individually, their intrinsic connection remains an under-explored theoretical and empirical gap. Existing studies on patient capital often implicitly exhibit a bias towards physical assets over human capital, failing to articulate its impact on a firm's most critical intangible asset—its workforce. Conversely, the human capital literature largely lacks a long-term financial perspective, failing to address how patient capital, as a strategic resource, provides both the motivation and capability for firms to upgrade their labor force. This paper bridges this gap by empirically investigating the causal impact and underlying mechanisms of patient capital on corporate human capital.

Hypothesis Development. Compared to traditional venture capital, patient capital is characterized by a long-term horizon, higher risk tolerance, and active corporate governance engagement. It focuses on corporate fundamentals and long-term competitiveness rather than short-term returns [21]. Consequently, patient capital is uniquely positioned to drive human capital upgrading through three main channels: capital deepening, R&D expansion, and corporate monitoring.

(1) Patient Capital, Capital Deepening, and Human Capital Upgrading. Driven by a long-term value orientation, patient capital encourages firms to invest in physical capital with long-term payoffs, such as advanced R&D equipment and digital systems. This directly increases a firm's capital intensity, leading to capital deepening. According to the capital-skill complementarity hypothesis [22], physical capital is highly complementary to skilled labor but substitutable for unskilled labor [23-24]. Advanced physical capital typically entails higher technical complexity, requiring a highly educated workforce with specialized skills for effective operation and maintenance [16]. Therefore, the capital deepening induced by patient capital generates strong demand for high-skilled talent. To maximize the productivity of new capital goods, firms must increase their investments in engineers, R&D personnel, and other high-quality human capital.

(2) Patient Capital, R&D Expansion, and Human Capital Upgrading. Firms backed by patient capital are more likely to sustain R&D and strategic investments [25]. The expansion of R&D investment optimizes labor allocation by complementing skilled workers and displacing low-skilled ones. First, investment expansion drives job creation for highly skilled labor. R&D execution requires professionals with innovative capabilities and expertise [26]. Ample R&D funding provides better research resources and career prospects, creating an attractive platform for top talent to realize their potential. Second, R&D expansion drives job destruction for low-skilled labor. Technological progress stemming from R&D investment automates routine and procedural tasks, thereby reducing the firm's relative demand for low-skilled workers [18].

(3) Patient Capital, Corporate Monitoring, and Human Capital Upgrading. Externally, the infusion of patient capital serves as a "certification effect," signaling a firm's long-term growth potential to the market. This attracts analyst coverage and enhances information transparency. Under sustained market scrutiny, firms have stronger incentives to regulate their operations, maintain social trust, and fulfill their responsibility to invest in high-skilled human capital, thus driving structural upgrading [27]. Internally, patient capital investors actively participate in decision-making and curb earnings management [2]. Prioritizing long-term value, these engaged shareholders pressure firms to establish scientific human resource systems and mitigate managerial myopia, providing institutional safeguards for human capital investments.

Based on the theoretical analysis above, we propose the following hypotheses:

Hypothesis 1 (H1): Patient capital significantly promotes the upgrading of corporate human capital.

Hypothesis 2 (H2): Patient capital drives corporate human capital upgrading through three mechanisms: capital deepening, R&D-induced skill-biased creative destruction, and strengthened internal and external monitoring.

3. Empirical Design

Model Specification. To investigate the relationship between patient capital and corporate human capital, following Jiang and Wu (2024) [8] and Ye et al. (2022) [18], we construct the following two-way fixed effects model:

$$DG_{ijt} = \beta_0 + \beta_1 patient\_capital_{ijt} + \sum_p \beta_p Controls_{pijt} + \gamma_j + \lambda_t + \varepsilon_{ijt} \quad (1)$$

Where i, j and t index firm, industry, and year, respectively. The dependent variable, DG represents the firm's human capital level. The key explanatory variable, $patient\_capital$ represents the firm's patient capital. $Controls$ is a vector of firm-level control variables. γ_i and λ_t denote industry and year fixed effects, respectively, to absorb unobservable time-invariant industry characteristics and macroeconomic shocks. ε_{it} is the random error term. The coefficient of interest is β_1, which captures the net effect of patient capital on human capital. Based on our theoretical hypotheses, we expect β_1 to be significantly positive. Furthermore, to address potential heteroskedasticity and within-firm serial correlation, robust standard errors are clustered at the firm level.

Variable Definitions. (1) Dependent Variable. Corporate Human Capital (DG). The literature typically measures human capital based on employees' educational attainment [28]. Accordingly, we use the proportion of employees holding a master's degree or higher relative to the total workforce to proxy for the firm's highly educated employee ratio, thereby capturing the structural characteristics of human capital within the firm.

(2) Key Explanatory Variable. Patient Capital ($patient\_capital$). Existing studies generally gauge patient capital from the perspectives of relational and strategic financing [7]. In the baseline regression, adopting a relational financing perspective, we measure patient capital using the ratio of long-term liabilities to total liabilities. Specifically, it is calculated as the sum of long-term loans, bonds payable, and long-term accounts payable, scaled by total liabilities [8].

(3) Control Variables. Following the mainstream literature [4, 7], we control for a comprehensive set of firm characteristics: firm size (Size), return on assets (ROA), leverage (Lev), asset turnover (ATO), cash flow ratio (Cashflow), listing age (ListAge), firm age (FirmAge), ownership concentration (Top5), and audit quality (Big4). Detailed definitions of all variables are provided in Table 1.

Table 1. Variable Definitions

Type	*Symbol*	Variable Name	Definition
Dependent Variable	*DG*	Human Capital Level	Number of employees with a master's degree or higher / Total employees
Independent Variable	*patient_capital*	Patient Capital	Long-term liabilities / Total liabilities
Control Variables	*Size*	Firm Size	Natural logarithm of total assets
	ROA	Return on Assets	Net income / Total assets
	Lev	Leverage	Total liabilities / Total assets
	ATO	Asset Turnover	Operating revenue / Average total assets
	Cashflow	Cash Flow Ratio	Net cash flow from operating activities / Total assets
	ListAge	Listing Age	ln (Current year - Listing year + 1)
	FirmAge	Firm Age	ln (Current year - Year of establishment + 1)
	Top5	Ownership Concentration	Total shares held by the top five shareholders / Total shares
	Big4	Big 4 Audit	1 if the firm is audited by a Big 4 accounting firm in the current year, 0 otherwise

Sample Selection and Data Sources. Our initial sample comprises Chinese A-share listed firms from 2007 to 2023. To ensure data validity and reliability, we apply the following screening criteria: (1) excluding firms in the financial industry; (2) excluding firms with abnormal financial status during the sample period, specifically those receiving Special Treatment (ST, *ST, or PT); and (3) dropping observations with missing values for key variables. This screening process yields a final unbalanced panel of 28,337 firm-year observations. Additionally, to mitigate the influence of extreme outliers, all continuous variables are winsorized at the 1st and 99th percentiles. Financial and corporate governance data are primarily sourced from the China Stock Market & Accounting Research (CSMAR) and Wind databases.

4. Empirical Results

Descriptive Statistics. Table 2 presents the descriptive statistics for the main variables. The mean value of corporate human capital (*DG*) is 0.080 with a standard deviation of 0.111, indicating significant variation in human capital levels across the sample firms. The mean and standard deviation of patient capital (*patient_capital*) are 0.131 and 0.137, respectively, with a maximum value of 0.573, demonstrating considerable dispersion in the proportion of patient capital among the observed firms.

Table 2. Descriptive Statistics of Key Variables

Variable	Observations	Mean	Std. Dev.	Min	Max
DG	28,337	0.080	0.111	0	0.617
patient_capital	28,337	0.131	0.137	0	0.573
Size	28,337	22.390	1.262	19.980	26.100
Lev	28,337	0.461	0.196	0.072	0.888
ROA	28,337	0.033	0.063	-0.205	0.207
ATO	28,337	0.667	0.450	0.086	2.534
Cashflow	28,337	0.047	0.068	-0.146	0.234
Top5	28,337	0.504	0.150	0.199	0.866
ListAge	28,337	2.405	0.590	1.099	3.401
FirmAge	28,337	2.948	0.321	2.079	3.555
Big4	28,337	0.061	0.240	0	1

Baseline Regression Analysis. Table 3 reports the baseline regression results of patient capital on corporate human capital. Column (1) presents the results without control variables and fixed effects, while Column (4) presents the full model controlling for firm characteristics, industry fixed effects, and year fixed effects. Across all specifications, the estimated coefficients of *patient_capital* remain significantly positive at the 1% level. This finding suggests that an increase in a firm's patient capital is associated with a higher proportion of employees holding master's degrees or above, confirming that patient capital significantly promotes corporate human capital upgrading. Thus, Hypothesis 1 is supported.

Table 3. Baseline Regression Results

Variables	(1)	(2)	(3)	(4)
	DG	DG	DG	DG
patient_capital	0.053***	0.037***	0.031***	0.035***
	(5.241)	(3.842)	(2.906)	(3.442)
Control Variables	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes
Year FE	No	Yes	No	Yes
Observations	28,337	28,337	28,337	28,337
R-squared	0.004	0.048	0.019	0.059

(Note: Robust t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.)

Endogeneity Analysis. A potential endogeneity issue may arise from reverse causality: while patient capital relaxes financing constraints to boost human capital, firms with superior human capital might naturally attract more patient capital. To address this, we employ the instrumental variable two-stage least squares (IV-2SLS) approach. Following [29], we construct the IV using the industry-average patient capital (excluding the focal firm). This IV satisfies the relevance condition as a firm's patient capital is correlated with industry peers, and it meets the exogeneity condition since the industry average does not directly affect an individual firm's human capital structure.

Table 4 reports the IV-2SLS estimation results. In the first stage (Column 1), the coefficient of the IV is significantly positive at the 1% level, with a first-stage F-statistic of 2272.43 (well above the conventional threshold of 10), strongly rejecting the weak instrument hypothesis. In the second stage (Column 2), the estimated coefficient of *patient_capital* remains significantly positive at the 1% level, reinforcing our main conclusion that patient capital facilitates human capital enhancement after mitigating endogeneity concerns.

Table 4. Endogeneity Test IV-2SLS Estimation

Variable	(1) First Stage	(2) Second Stage
	patient_capital	DG
iv	0.712***	
	(47.668)	
patient_capital		0.128***
		(6.607)
Control Variables	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	28,337	28,337
R-squared	0.253	0.019

(Note: Robust t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.)

Robustness Checks. (1) Propensity Score Matching (PSM). Patient capital providers may systematically select target firms with pre-existing high human capital, causing self-selection bias. We employ 1:1 nearest-neighbor matching without replacement based on a Logit model, dividing firms into treatment and control groups based on whether their lagged patient capital is above the industry-year median. Using 20,571 matched firm-year observations, Column (1) of Table 5 shows the coefficient remains significantly positive, confirming our findings are robust to self-selection bias.

(2) Alternative Fixed Effects. We replace industry fixed effects with firm fixed effects to absorb unobservable time-invariant firm-level heterogeneity. Column (2) shows that the positive effect of patient capital remains significant.

(3) Alternative Sample Period. To rule out the confounding effects of the 2015 stock market crash and the 2020 COVID-19 pandemic shock, we drop observations from 2015 and restrict the sample to the pre-2020 period. Column (3) indicates the coefficient remains significant at the 1% level, proving our baseline result is not driven by extreme macroeconomic events.

(4) Alternative Measure of Explanatory Variable. To ensure measurement robustness, we follow Wu et al. (2022) [7] to proxy patient capital using the shareholding ratio of strategic institutional investors. An institutional investor is defined as strategic if the ratio of its current holding to its three-year rolling standard deviation exceeds the industry-year median; otherwise, it is transient. Column (4) shows the estimated coefficient (0.0003) remains significantly positive at the 1% level, further validating the robustness of our conclusions.

Table 5. Robustness Checks

Variable	(1) PSM	(2) Firm FE	(3)Sub-sample	(4)Alt.Measure
	DG	DG	DG	DG
patient_capital	0.023**	0.017**	0.057***	0.0003***
	(2.129)	(1.991)	(4.492)	(3.429)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	Yes
Firm FE	No	Yes	No	No
Year FE	Yes	Yes	Yes	Yes
Observations	20,571	28,337	15,703	28,337
R-squared	0.059	0.026	0.058	0.059

(Note: Robust t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.)

5. Further Analysis

Heterogeneity Analysis. (1) Geographic Location. Compared to the central and western regions, Eastern China possesses a more advanced financial system, providing long-term capital support that aligns with corporate human capital investments. Furthermore, the eastern region benefits from a superior innovative ecosystem with a clear demand for, and higher willingness to pay for, highly educated talent. This motivates firms to allocate long-term patient capital specifically toward recruiting and retaining high-caliber teams. In contrast, the financial environment in central and western regions may favor short-term collateralized loans, and their industries are predominantly traditional manufacturing with a relatively lower reliance on highly educated human capital. Consequently, even if patient capital is acquired in these regions, it is more likely allocated to fixed-asset investments rather than human capital accumulation.

Based on this, we examine the heterogeneous impact of patient capital across different regions. The results, reported in Columns (1)-(3) of Table 6, show that the estimated coefficient of *patient_capital* is significantly positive only in the eastern region, remaining insignificant in the central and western regions. This indicates significant regional disparities: only in the economically developed and innovation-driven eastern region can enterprises effectively convert patient capital into a high-quality reserve of highly educated talent.

(2) Ownership Structure. A firm's ownership structure profoundly influences its funding sources and resource allocation. We divide the sample into State-Owned Enterprises (SOEs) and Non-State-Owned Enterprises (Non-SOEs). As shown in Columns (4) and (5) of Table 6, the coefficient of *patient_capital* is 0.042 (significant at the 1% level) for SOEs and 0.029 (significant at the 5% level) for Non-SOEs. To test the significance of this difference, we employ a Bootstrap approach for inter-group coefficient comparison, yielding an empirical p-value of 0.021. This confirms that patient capital exerts a significantly stronger promotional effect on human capital in SOEs than in Non-SOEs.

The underlying rationale is twofold: (1) Backed by implicit government guarantees, SOEs enjoy greater access to patient capital with lower financing costs and longer maturities, enabling them to focus these funds on human capital upgrading. Conversely, Non-SOEs face higher costs and greater difficulties in obtaining long-term debt, making such capital more precious. Consequently, Non-SOEs may exhibit a stronger "efficiency orientation," allocating long-term debt strictly to projects that yield immediate competitive advantages. (2) Compared to Non-SOEs, SOEs possess unique institutional attractiveness to highly educated talent due to stable employment, superior welfare benefits, and household registration (Hukou) advantages.

(3) CEO Duality. CEO duality refers to the corporate governance structure where a single individual serves as both the Chief Executive Officer (CEO) and the Chairman of the Board. Investing heavily in human capital involves both financial pressure and strategic risk. In firms with CEO duality, concentrated executive power may facilitate the deployment of patient capital toward human capital investments. However, the lack of checks and balances can also lead to investment failures driven by managerial entrenchment, mismanagement, or arbitrary decision-making, resulting in a dual dilemma of financial distress and brain drain. Conversely, when the roles are separated, mutual constraints among internal positions foster adherence to long-term strategies, facilitating the recruitment of high-caliber talent and human capital upgrading.

We construct a dummy variable for CEO duality (Dual) and conduct sub-sample regressions. Columns (6) and (7) of Table 6 show that the coefficient of *patient_capital* is 0.026 (significant at the 10% level) for dual firms, but rises to 0.048 (significant at the 1% level) for non-dual firms. This suggests that the operational efficiency of patient capital is compromised in the absence of effective board oversight. The separation of powers ensures that patient capital is consistently and efficiently allocated toward the strategic goal of human capital enhancement, avoiding wasteful expenditures.

Table 6. Heterogeneity Analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Eastern	Central	Western	SOEs	Non-SOEs	Dual	Non-Dual
patient_capital	0.044***	0.009	0.021	0.042***	0.029**	0.026*	0.048***
	(3.523)	(0.395)	(0.847)	(2.586)	(2.329)	(1.647)	(4.188)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	19,585	5,066	3,686	11,395	16,942	6,991	21,194
R-squared	0.060	0.114	0.087	0.096	0.060	0.060	0.063

(Note: Robust t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.)

Mechanism Analysis. Based on our theoretical framework, patient capital may promote human capital upgrading through the "capital deepening mechanism," the "R&D expansion and skill-biased creative destruction mechanism," or the "internal and external monitoring mechanism." We test these three channels to uncover the underlying pathways.

(1) Capital Deepening Mechanism. We proxy the firm's fixed asset investment level (*Invest*) using the ratio of current-year fixed asset investments to beginning-of-year total assets. Column (1) of Table 7 shows that the coefficient of *patient_capital* is significantly positive, indicating that patient capital spurs fixed asset investment. According to the capital-skill complementarity hypothesis, an increase in fixed assets stimulates the demand for high-quality talent, thereby driving human capital upgrading.

(2) R&D Expansion Mechanism. We use the ratio of R&D expenditure to total assets (*RD*) to proxy for R&D deepening. Column (2) reveals a significantly positive coefficient (0.930) at the 1% level, suggesting that patient capital boosts R&D investment. The expansion of R&D drives corporate innovation, creating a "creative destruction" effect where low-skilled workers face job displacement as they lose their competitive edge. Simultaneously, the skill-biased nature of R&D demands higher professional competence, thereby creating jobs for high-skilled labor.

(3) Internal and External Monitoring Mechanisms. For internal monitoring, following Chen et al. (2025)[21], we construct a corporate talent attention lexicon. We first use national talent policy documents to identify "talent" as the core seed word. A Word2Vec model is then applied to extract 20 semantically related high-frequency terms. Additionally, based on Li et al. (2024)[29], we manually supplement 15 keywords reflecting talent attraction, cultivation, utilization, and retention. Using the jieba library in Python, we perform textual analysis on the Management Discussion and Analysis (MD&A) sections of annual reports. We calculate the corporate talent attention index (*Talent_attention*) as the natural logarithm of the total keyword frequency plus one. Column (3) shows that patient capital significantly enhances internal talent attention at the 1% level. Driven by long-term value creation, patient capital curbs managerial myopia and opportunistic behaviors, forcing firms to prioritize talent strategies.

For external monitoring, following Hu et al. (2021) [30], we measure analyst attention (*AnaAttention*) using the natural logarithm of the number of analysts covering the firm plus one. Column (4) demonstrates that *patient_capital* has a significantly positive coefficient (0.214) at the 1% level. The entry of patient capital creates a "certification effect" that attracts analyst coverage. Heightened analyst scrutiny further suppresses managerial short-termism, encouraging long-term investments in human capital. Thus, Hypothesis 2 is fully supported.

Table 7. Mechanism Analysis

Variables	(1)	(2)	(3)	(4)
	Capital Deepening	R&D Expansion	Internal Monitoring	External Monitoring
	Invest	R&D	Talent_attention	AnaAttention
patient_capital	0.097***	0.930***	5.282***	0.215***
	(19.949)	(2.650)	(3.159)	(3.087)
Control Variables	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	28,314	21,581	24,230	28,337
R-squared	0.183	0.243	0.100	0.457

(Note: Robust t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.)

6. Conclusions and Policy Recommendations

Against the backdrop of intertwined global economic uncertainty and rapid technological advancement, patient capital—a unique capital form characterized by a long-term investment horizon, high risk tolerance, and strong social responsibility—has increasingly garnered the attention of policymakers and corporate practitioners. Using a sample of Chinese A-share listed companies from 2007 to 2023, this paper empirically investigates the impact of patient capital on corporate human capital. Through theoretical analysis and empirical testing, we draw the following conclusions:

(1) Patient capital significantly enhances corporate human capital. A robust positive relationship exists between the inflow of patient capital and the upgrading of a firm's human capital. This conclusion remains statistically significant after addressing endogeneity via the instrumental variable (IV-2SLS) approach and conducting a battery of robustness checks, including Propensity Score Matching (PSM), the use of alternative fixed effects, sub-sample analyses, and alternative variable measures. (2) The positive effect of patient capital operates through three main mechanisms: capital deepening (from a physical capital perspective), R&D expansion (from a technological perspective), and enhanced internal and external monitoring (from a governance perspective). These channels collectively stimulate the firm's demand for high-quality talent and facilitate the structural upgrading of human capital. (3) Heterogeneity analyses reveal that the promotional effect of patient capital on human capital is more pronounced in enterprises located in eastern China, State-Owned Enterprises (SOEs), and firms without CEO duality (i.e., separation of the CEO and Chairman roles).

This study not only enriches the existing literature on the micro-economic consequences of patient capital and the determinants of corporate human capital but also offers crucial practical implications for leveraging long-term finance to drive talent upgrading. Based on these findings, we propose the following policy recommendations:

First, at the macroeconomic level, policymakers should foster a conducive environment to ensure a sustainable supply of patient capital. Specifically, top-level design must be strengthened to ensure policy clarity, continuity, and operability, while refining the legal framework to provide institutional safeguards for long-term investments. Furthermore, a multi-tiered capital market system should be optimized to match patient capital with enterprises across various life-cycle stages—supporting start-ups, diversifying financing for growth-stage firms, and tailoring services for mature ones. Additionally, diverse forms of patient capital should be cultivated. State-owned capital should play a "stabilizing" (ballast) role by focusing on industries vital to national security and socio-economic development; private capital should be incentivized to serve the real economy and stimulate market vitality; and international capital with a global perspective should be systematically introduced to foster a mature, long-term financial ecosystem in China.

Second, at the microeconomic level, enterprises should cultivate internal competitive advantages to become high-quality recipients for patient capital. To attract long-term investors, firms must formulate clear long-term strategic plans, curb managerial short-termism, and enhance the transparency of R&D and innovation projects. Internally, a stable corporate governance mechanism is essential. By maintaining a stable core executive team and implementing long-term incentive plans, firms can align managerial interests with long-term corporate goals, ensuring the consistent execution of corporate strategy. Externally, firms should guide shareholders toward a long-term value-creation mindset. Regular issuance of ESG (Environmental, Social, and Governance) reports can systematically demonstrate the firm's strategic commitments and achievements in social responsibility and governance, thereby mitigating excessive shareholder focus on short-term stock price fluctuations and building mutual trust.

Finally, efforts should be directed toward the dynamic alignment of patient capital and corporate human capital. As China navigates the critical transition from a "demographic dividend" to a "talent dividend," the role of patient capital in human capital upgrading becomes indispensable. Institutional investors should be encouraged to incorporate human capital enhancement metrics into their investment decision-making and post-investment evaluation frameworks. Through effective policy

guidance, the integration of the industrial chain, financial chain, and talent chain can be achieved, ensuring that patient capital not only drives industrial upgrading but also precisely facilitates the accumulation and optimization of human capital.

References

[1] S.X. Li, X. Liu, H.L. Sun, Promoting the development of new-quality productive forces through patient capital: Characteristics, current issues, and cultivation pathways, *Research on Financial and Economic Issues* (2024) 14-28. (in Chinese)

[2] H.F. Hu, Y. Zhang, A.P. Wang, Research progress on the issue of patient capital, *Economic Dynamics* (2025) 192-208. (in Chinese)

[3] Y.X. Hong, J.C. Jiang, Cultivating and expanding patient capital to drive the development of new-quality productive forces, *Economist* (2024) 5-14. (in Chinese)

[4] L. Wen, S.F. Li, The impact of patient capital on enterprises' new-quality productivity, *China Circulation Economy* 38 (2024) 86-97. (in Chinese)

[5] R. Alvarez, M. Jara, C. Pombo, Do institutional shareholders influence corporate investment? Evidence from emerging markets, *Journal of Corporate Finance* 53 (2018) 38-64.

[6] O. Galor, O. Ozak, The agricultural origins of time preference, *American Economic Review* 106 (2016) 3064-3103.

[7] M.J. Wu, P. Zhang, Z.Y. Zhao, The impact of patient capital and innovation investment on firm performance: Evidence from listed companies on the SME board, *Scientific Decision-Making* (2022) 55-72. (in Chinese)

[8] Z.Y. Jiang, F.X. Wu, Patient capital, the digital economy, and innovation efficiency: Empirical evidence from A-share listed manufacturing companies, *Journal of Hohai University (Philosophy and Social Sciences Edition)* 26 (2024) 121-133. (in Chinese)

[9] R. Deeg, I. Hardie, S. Maxfield, What is patient capital, and where does it exist?, *Socio-Economic Review* 14 (2016) 615-625.

[10] S. Kaplan, Banking unconditionally: The political economy of Chinese finance in Latin America, *Review of International Political Economy* 23 (2016) 643-676.

[11] J.Y. Lin, Y. Wang, The new structural economics: Patient capital as a comparative advantage, *Journal of Infrastructure, Policy and Development* 1 (2017) 4-23.

[12] M.F. Lu, W.J. Ouyang, Patient capital: Development framework, international experience, and the Chinese path, *The Economist* (2025) 14-25. (in Chinese)

[13] H. Qi, B.H. Han, Z.J. Li, Theoretical foundations and implementation pathways for strengthening patient capital in the digital economy era, *Chinese Economic Issues* (2024) 16-28. (in Chinese)

[14] T.W. Schultz, Capital formation through education, *Journal of Political Economy* 68 (1960) 571-583.

[15] G.S. Becker, *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, Columbia University Press, New York, 1964.

[16] Q.R. Liu, C. Zhao, Tax policy incentives and the upgrading of corporate human capital, *Economic Research Journal* 55 (2020) 70-85. (in Chinese)

[17] Y.F. Li, J. Li, R.R. Xiao, Social insurance contribution collection and management and the upgrading of corporate human capital structure, *Economic Research Journal* 58 (2023) 158-174. (in Chinese)

[18] Y.W. Ye, X. Li, G.C. Liu, Digital transformation and the upgrading of corporate human capital, Financial Research (2022) 74-92. (in Chinese)

[19] X.X. Ma, T.J. Tang, G.J. Zheng, Mixed-ownership reform of state-owned enterprises and human capital structure adjustment: A perspective based on the allocation of high-level talent, *Finance and Trade Economics* 41 (2020) 101-116. (in Chinese)

[20] W. Yang, D.M. Kong, Internal wage gaps and human capital restructuring in enterprises, *Financial Research* (2019) 150-168. (in Chinese)

[21] X.Y. Chen, L.Y. Suo, J. Chen, The employment effects of government-guided funds: A perspective based on financing constraints and internal and external oversight, *Modern Financial Research* 30 (2025) 39-52. (in Chinese)

[22] Z. Griliches, Capital-skill complementarity, *The Review of Economics and Statistics* 51 (1969) 465-468.

[23] G.J. Shen, The "capital-skill complementarity" hypothesis: Theory, empirical testing, and applications, *Economics (Quarterly)* 15 (2016) 1653-1682. (in Chinese)

[24] H.Q. Ma, G.T. Huang, R. Wang, The impact of physical capital accumulation on China's urban-rural income gap: A capital-skill complementarity perspective, *Management World* (2017) 32-46. (in Chinese)

[25] T.S. Dai, Q. Zhao, Innovation incentive policies and corporate skill demands: Evidence from the R&D expense super-deduction policy, *Fiscal Research* (2022) 92-112. (in Chinese)

[26] X.X. Ma, T.J. Tang, C.Y. Zhong, Judicial protection of intellectual property rights and the upgrading of corporate human capital structure: A quasi-natural experiment based on the establishment of intellectual property courts, *Journal of Zhongnan University of Economics and Law* (2023) 107-122. (in Chinese)

[27] D.L. Shen, X.Y. Jiang, Social trust and the efficiency of corporate labor investment, *Financial Research* (2022) 152-168. (in Chinese)

[28] S. Liu, X.J. Li, A study on the impact of fiscal pressure on corporate digital transformation, *Journal of Management* 21 (2024) 1456-1466. (in Chinese)

[29] X.P. Li, H.Y. Zhao, F.T. Jiang, et al., China's regional talent policies and regional innovation performance: Innovation measurement and empirical testing based on 3,171 policy texts, *Economic and Financial Research* 50 (2024) 4-18. (in Chinese)

[30] N. Hu, F.J. Xue, H.N. Wang, Does managerial myopia affect corporate long-term investment? — Based on text analysis and machine learning, *Management World* 37 (2021) 139-156. (in Chinese)